



DEPARTMENT OF NATURAL RESOURCES

DIVISION OF WATER RESOURCES

Bill Ritter, Jr.
Governor

Harris D. Sherman
Executive Director

Dick Wolfe, P.E.
Director and
State Engineer

April 25, 2008

Mr. Dave Fox, P.E.
Fox Engineering Solutions
670 Canyon Creek Drive
Grand Junction, CO 81503

When replying please refer to:
TRAIL RIDGE MV 1-23 WATER IMPOUNDMENT DAM
AKA Williams Fresh Water Pit Dam
Water Division 5, DAMID: 390128

RE: Approval of Plan to Alter Dam to a Non-Jurisdictional Size:

Dear Mr. Fox:

Thank you for submitting for our review the plan to alter the Trail Ridge MV 1-23 Water Impoundment Dam to a non-jurisdictional size. The submittal, including a written letter of intent along with support drawings and calculations for the proposed spillway, to alter the dam to a non-jurisdictional size were provided under the provisions of Rules 11.2.2 and 6.1.3 of Colorado's "Rules and Regulations for Dam Safety and Dam Construction". We have completed our review of the documents and have found them to be acceptable for construction. We are accepting the documents by letter in accordance with the provisions of Rule 6.A.(3) of the Rules and Regulations. Our acceptance and approval of the documents are effective as of the date of this letter with the following contingency. The construction oversight of the proposed alteration and improvements should be performed by Fox Engineering Solutions.

Please keep Mr. John G. Blair, our Division 5 Dam Safety Engineer, apprised of the construction so that he can perform any necessary construction inspections. Once our office performs a final construction inspection, and the rehabilitation project has been successfully completed and as-constructed documents have been submitted and approved, the storage restriction will be removed and water storage in the reservoir will be permitted.

Office of the State Engineer

1313 Sherman Street, Suite 818 • Denver, CO 80203 • Phone: 303-866-3581 • Fax: 303-866-3589

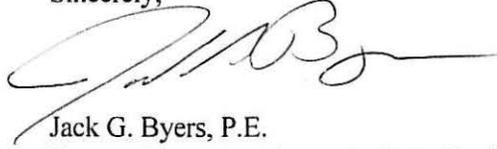
www.water.state.co.us

Mr. Dave Fox – Trail Ridge MV 1-23 Water Impoundment Dam
April 25, 2008

Page 2

Thank you for the efforts to improve the safety of this dam. Should you have any questions concerning this matter, please contact John G. Blair at (970) 945-5665, ext. 5016.

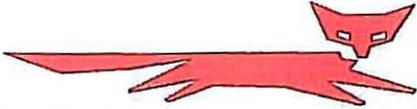
Sincerely,

A handwritten signature in black ink, appearing to read 'JGB', with a long horizontal flourish extending to the right.

Jack G. Byers, P.E.
Deputy Director and Deputy State Engineer

cc: Mark Haynes, Chief of Dam Safety
Alan Martellaro, Division Engineer
John G. Blair, Dam Safety Engineer
Jim Lemon, Water Commissioner

JGB/jgb/Trail Ridge approval 4_08.doc



Fox Engineering Solutions, LLC

April 15, 2008

John Blair, Dam Safety Engineer
Colorado Division of Water Resources
P.O. Box 396
Glenwood Springs, CO 81602

RE: Williams Production RMT Fresh Water Pit Dam - Garfield County, Colorado
DAMID 450128 WD 5, District 45

Mr. Blair,

As per our discussion and your email correspondence of April 9, 2008, Williams is proposing to locate the spillway for the subject dam on the southwest corner of the site. This will put the spillway in an area of cut or undisturbed native material which will eliminate erosion threats to the dam embankment. Plan and cross section views of the structure and proposed spillway are attached as Sheets 1 and 2.

The spillway has been designed to accommodate anticipated inflows from both water pumped into the pond and inflow from direct precipitation. Water is supplied from Parachute Creek to the pond through a pump and pipeline. The pumping system has a maximum capacity of approximately 140 gpm or 0.31 cfs.

Because of its location, there is no drainage basin associated with the facility other than the pond surface area and surrounding tributary embankment. Discharge through the spillway, attributable to precipitation runoff, has been estimated using a simplified Rational Method ($Q = CIA$), where the peak discharge Q is computed from a runoff coefficient C , rainfall intensity I and the drainage basin area A . In this case, Q equates to 0.38 cfs ($1.0 \times 0.37 \text{ in/hr} \times 1.04 \text{ acres}$). The assumed rainfall event of 2.2 in. /6-hours was obtained from the 100-year 6-hour event delineated in NOAA - Atlas II.

The proposed spillway, as shown on the drawings, is a trapezoidal-shaped channel with 2:1 side slopes approximately 50 ft. long by 2 ft. deep with a 2 ft. bottom width and is set at a 0.5% slope. Should the inflow pump malfunction and the 100-year 6-hour precipitation event occur simultaneously, the total estimated discharge through the spillway is 0.69 cfs. Utilizing the Manning-Chezy open channel flow formula, the proposed spillway will have a flow depth of 0.35 ft at the projected maximum discharge of 0.69 cfs. Formula input parameters, capacity and calculation results are tabularized on Sheet 1 of 2.

Concerning the liner, Williams will repairs tears in the synthetic liner. In areas where protruding rocks have the potential to tear the liner, the liner will be laid back, such that, protruding rocks can be removed or covered with a finer grained material.

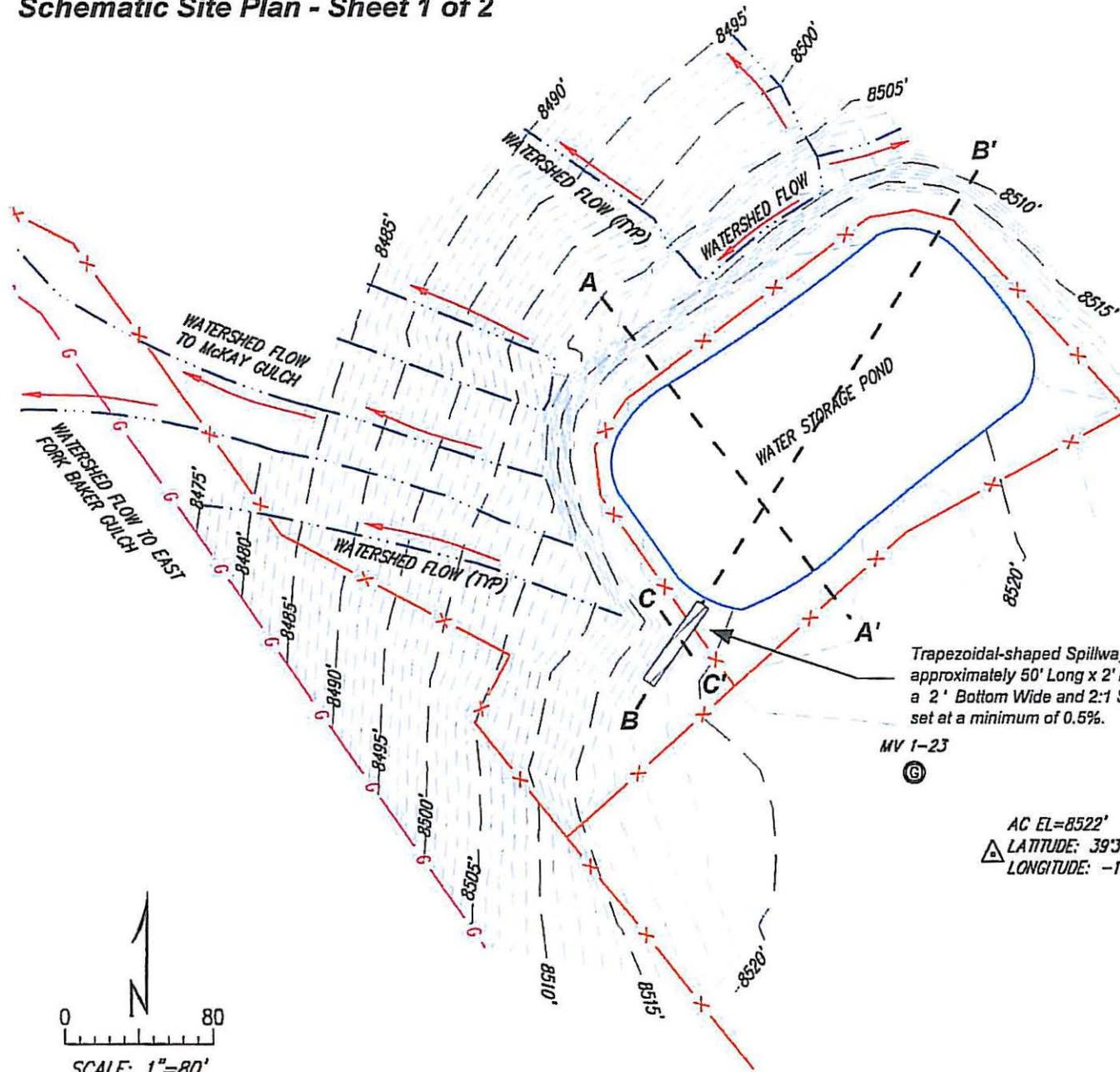
If you have any questions or need additional information, please don't hesitate to call me at (970) 250-5505. Williams wishes to initiate these repairs as soon as possible and would appreciate your timely review of this proposal.

Best regards,

David Fox, P.E.
Principal Engineer
Fox Engineering Solutions LLC
670 Canyon Creek Drive
Grand Junction, CO 81503
Ph: (970) 250-5505 Fax (626) 784-0667
Email: coloradofox@mybluelight.com & david.fox@williams.com

attachments

**Williams Production RMT
Trail Ridge MV 1-23 Water Impoundment Dam
Schematic Site Plan - Sheet 1 of 2**



**Williams Production RMT
Trail Ridge MV 1-23 Impoundment Spillway Channel
Flow Capacity Utilizing Manning-Chezy Formula**

Depth (Ft.)	Wetted Perimeter	Area (Ft. ²)	Hydraulic Radius	Slope	Flow Q	Velocity (Ft./Sec.)
0.25	3.12	0.63	0.20	0.005	0.37	0.60
0.35	3.57	0.95	0.27	0.005	0.68	0.72
0.50	4.24	1.50	0.35	0.005	1.31	0.83
0.75	5.35	2.63	0.49	0.005	2.85	1.09
1.00	6.47	4.00	0.62	0.005	5.09	1.27
1.50	8.71	7.50	0.86	0.005	11.92	1.59
2.00	10.94	12.00	1.10	0.005	22.41	1.87

Units:
Manning's n: 0.04

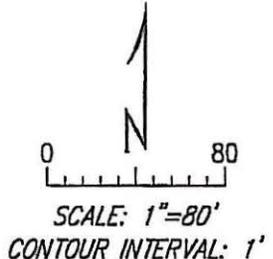
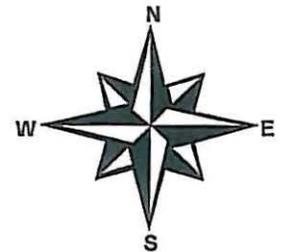
Bottom Wide (Ft.): 2

Side Slopes: 2:1 (Horizontal:Vertical)

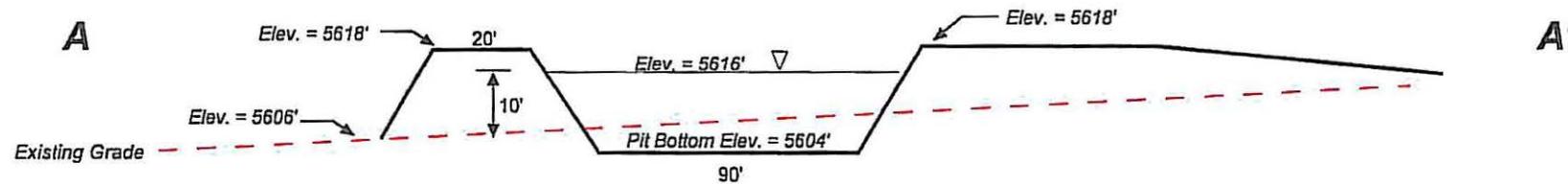
Trapezoidal-shaped Spillway Channel approximately 50' Long x 2' Deep with a 2' Bottom Wide and 2:1 Sideslopes set at a minimum of 0.5%.

MV 1-23
G

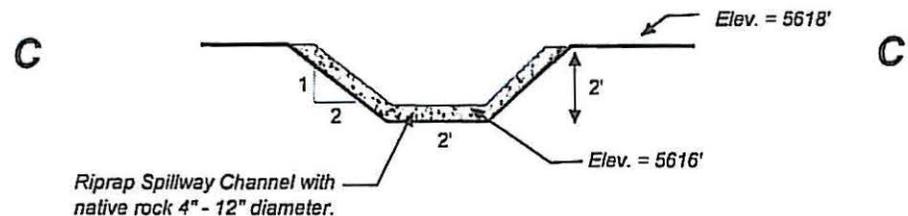
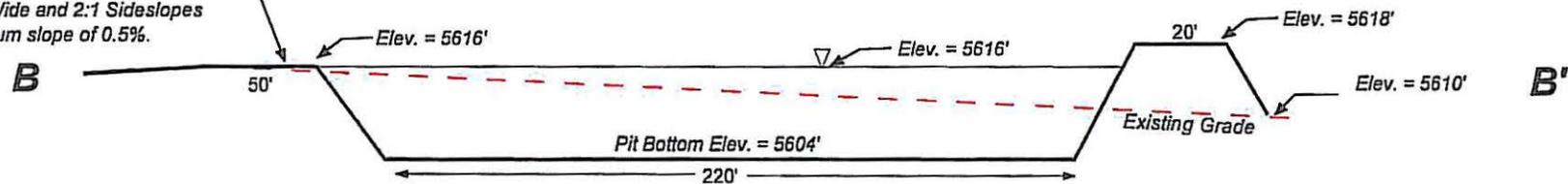
AC EL=8522'
▲ LATITUDE: 39°30'49.8"
LONGITUDE: -108°11'43.4"



**Williams Production RMT
Trail Ridge MV 1-23 Water Impoundment Dam
Schematic Cross Sections - Sheet 2 of 2**



Trapezoidal-shaped Spillway Channel approximately 50' Long x 2' Deep with a 2' Bottom Wide and 2:1 Sideslopes set at a minimum slope of 0.5%.



Riprap Spillway Channel with native rock 4" - 12" diameter.

Not to Scale